

**ABSTRACT****THE EFFECT OF LIPID COMPOSITION ON NANOSTRUCTURED  
LIPID CARRIER (NLC) UBIQUINONE CHARACTERISTIC AND  
EFFECTIVENESS AS AN ANTIAGING COSMETICS****TAMARA GUSTI EBTAVANNY**

The purpose of this research is to determine the optimum composition of solid lipid and liquid lipid in order to increase the penetration and effectiveness of Q10 as antioxidant in anti-aging cosmetics. Solid lipid and liquid lipid used in this study were cetyl palmitate and caprylic, which were combined to four (4) different ratios, namely 10:0; 9:1; 7:3 and 5:5. NLC Q10 in this study was produced by high shear homogenization method at 3400 rpm for 5 cycles and at 24000 for 1 cycle. The fourth formula was evaluated in term of characteristics, penetration and effectiveness. From the pH test, it was known that all formulas met the skin pH range (4.0-6.0). For the particle size test, all formulas (NLC 1 - NLC 4) were in the range from 269.13 to 354.77 nm with NLC 3 (7: 3) had the smallest particle size. The results of viscosity and surface tension test were also consistent with the theory, where the addition of liquid lipid reduced viscosity and surface tension of the system. The entrapment efficiency (EE) demonstrated the EE of NLC 1: 22.24%; NLC 2: 24.71%; NLC 3: 58.21% and NLC 4: 36.94%. The penetration test showed all systems were able to penetrate the dermis layer at the 5<sup>th</sup> hour. NLC 3 (7: 3) had more rapid onset, while the NLC Q10 with the ratio of lipid 9: 1, had slower onset of action but can penetrate farther than the other NLC Q10 system. The result of Q10 effectiveness test showed NLC 2 (9:1) has lowest total macrophage (23,33) and very dense collagen observation (score : 4). From this research, it can be concluded that NLC 2 (9: 1) had the most optimal lipid composition to increase the penetration and effectiveness of Q10 as an antioxidant in anti-aging cosmetics.

**Keywords: Ubiquinone, NLC, antioxidant, *antiaging***